CHAPTER VI

INFORMATION SERVICES FOR
PRODUCT PLANNING

1. Introduction
2. Functional units
3. Information Inputs
4. Product improvement
5. Maturity stage
6. Conclusion
1. INTRODUCTION.

An important output of R&D cell is a Product. Product planning is concerned with product development. It takes care of product renewal and product improvement at every stage. This includes development of existing products and systems, search for new products, selection and introduction of new products and withdrawal of unprofitable products.[1],[2] The product innovation strategies that motivates one to go for new products is presented in the following diagram. (Fig.11).

Important features in production development is product life. It can be broadly demarcated in three stages:[3],[4] & [5]

1) Development stage
2) Improvement stage and
3) Maturity stage.

1.1 The Development Stage.

It is innovative in nature. The volume is low, and manufacturing processes are characterised by the way of flexibility. The product has a high degree of novelty and competitive emphasis on functional performance. Through applications of new technology one is able to develop new products, for which we need specifications to help consumers. It
FIG. 11. PRODUCT INNOVATION STRATEGIES THAT MOTIVATES ONE TO GO FOR NEW PRODUCTS

<table>
<thead>
<tr>
<th>FIRMS IN THE STUDY</th>
<th>PRODUCT INNOVATION STRATEGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>26.2%</td>
<td>Technology driven</td>
</tr>
<tr>
<td>18.9%</td>
<td>High-budget diverse</td>
</tr>
<tr>
<td>23.8%</td>
<td>Low budget conservative</td>
</tr>
<tr>
<td>15.6%</td>
<td>Defensive, focused, technologically deficient</td>
</tr>
<tr>
<td>15.6%</td>
<td>Balanced strategy</td>
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</tbody>
</table>

- Technology driven: Technologically sophisticated R&D oriented Innovative
- High-budget diverse: High R&D spending Shortgun approach attack new markets
- Low budget conservative: Low R&D spending Undifferentiated products synergistic with production
- Defensive, focused, technologically deficient: Low technological sophistication Familiar markets serve new needs
- Balanced strategy: Technologically sophisticated R&D oriented Market oriented Large & growing markets
is at this stage people would like to identify the technological advances in fields with rapid change. A company should have sufficient capacity to quickly adapt, apt and improve the new technology to the needs of its market. This requires not only know-how regarding technology but also knowledge of the needs of the market. A creative approach to problem solving can be presented in the following diagram. (Chart 6).

1.2 Improvement Stage.

The activities at this stage involves the improvement in manufacturing efficiency, improvement in product preferences by consumers, improvement in product preferability in competitive markets. At this stage competence is needed to overcome competition and to reach users in an efficient manner.

1.3 Maturity Stage.

Which involves from promotion of products, which infusing consumer needs. Important aspect in maturity stage is to meet on time the product requirements of consumers. Often large scale production is required inorder to obtain cost benefit reflections. The necessary volume of information that should be projected requires a kind of stability with the same time known acquisition of novelty. It must have capacity to acquire new features needed to meet consumer markets and increase or decrease of production depending upon the market variations, managerial maturity in handling specialised manufacturing units and production basis is required in this stage.[6]
### CHART-6. A CREATIVE APPROACH TO PROBLEM SOLVING

<table>
<thead>
<tr>
<th>Systematic Problem Analysis</th>
<th>Fishbone with Headings</th>
<th>Fishbone w/o Headings</th>
<th>Nominal Group Technique</th>
<th>Brainstorming</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data-Based Problem-Solving</strong></td>
<td><strong>Creative Problem-Solving</strong></td>
<td></td>
<td></td>
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<tr>
<td>Systematic generation of data (Staying with the traditional problem-solving process).</td>
<td>Random generation of data (skipping around the process)</td>
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<tr>
<td>Greater volume of relevant data, but little innovative data.</td>
<td>Greater volume of irrelevant data and innovative data.</td>
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<tr>
<td>Preconceived model or format (e.g. results, equipment, environment, process, scale human resources, etc.)</td>
<td>Model or format follows the generation of data.</td>
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<tr>
<td>Structured participation.</td>
<td>Unstructured participation.</td>
<td></td>
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<tr>
<td>Problem has known standards and conditions, and the answer is expected to be discovered in the situation-specific data.</td>
<td>Problem has known and unknown standards and conditions. Answers are not expected to be discovered in the data; they are as yet untapped in individuals.</td>
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<tr>
<td>Present and past oriented.</td>
<td>Future oriented.</td>
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<tr>
<td>Thinking quality: reflective.</td>
<td>Thinking quality: impulsive.</td>
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<tr>
<td>Primarily logically verifiable</td>
<td>Primarily experimentally verifiable factors.</td>
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<tr>
<td>Known options.</td>
<td>Known and unknown options.</td>
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<tr>
<td>Best done by skillful groups (or by knowledgeable and systematic individuals).</td>
<td>Best done by creative or &quot;shrewd&quot; individuals (or individuals in unrestricted groups).</td>
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<td></td>
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<tr>
<td>Predictable results (within the realm of expectation).</td>
<td>Unpredictable results (innovative).</td>
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</tbody>
</table>
2. FUNCTIONAL UNITS.

Functional units of an R&D Project plan may be delineated as follows:

2.1 Environmental Analysis.

a) Assemble and evaluate information for corporate and divisional use.

b) Provide basic economic and political intelligence.

c) Provide industrial and competitive intelligence.

d) Identify and evaluate how opportunities and threats to the firm.

Strategic Programme Planning.

a) Provide leadership in the formulation of five year plan programme.

b) Co-ordinate and assist in the synthesis of market mission strategies.

c) Establish project priorities and optimum resource allocation.

d) Direct the attention of management to the improvement challenges facing in the company.

2.2 Venture Development.

a) Analyse and develop new ventures to achieve strategic goals.
b) Approve and implement acquisitions.

c) Seek, screen and opportunities evaluation.

d) Plan, implement testing and communication of new products.

e) Develop programme for approved major programmes and initiate actions.

2.3 Management innovation.

a) Conduct optimisation studies to new products and systems.[8]

b) Provide analytical problem solving skills to other functions, logistic analysis, venture analysis etc.,

c) Analyse strategic alternatives and determine best course of action.

d) Recommend management staff needs.

3. INFORMATION INPUTS.

3.1 Environmental Information Through Product Bulletins:

a) The information input at the very first stage for the environmental analysis is to draw information from new product development bulletins. Such news of production development can be found in trade and technology in the form of advertisement or sales writeup or list of products coming in the market. Alternatively or as such exhibitions or trade fair to access state of market for a given product and their value in relation to companies product plans. Some journals are financed entirely
by advertisement revenue and distributed to controlled circulation among readers.

1) Development of new product bulletins should be given to users at various levels in R&D management.

2) Such data helps to assemble drawn from different sources to provide information or assembling etc.

We can also draw information from handbooks, directories, text books etc. Directories may help to identify major manufacturing process with a wide range of products and not prepared to pay for some or all entries under different headings. The companies may be provided an entry on a product because it manufactures the product but also it grants sub contract to others. We can also obtain a production classification, which is broad in directory. Such information about products will help assessing and identifying the environment for new product development.

3.2 Country profile.

This is kind of intelligence information regarding the economic and political climate of the country in which operation increases. These days the marketing of a product on a large extent depends on the political and economic development of the country and its implementation. Therefore, a sustained country profile has to be built up to meet these requirements. A kind of environment planning has to be done to identify feature which are improving product marketing and sales. For this purpose the
growth structures or statements of policies and meeting of the ministries are to be provided.

3.3 Information Sources for country profile.

Such information can be obtained from several commercial public trade journals and also from pure technological journals. These two sources of information includes the following types of information:

i) Original and scientific articles

ii) Non original and non scientific articles

iii) Statistics and market information

iv) Products and process information

v) Directory information

vi) Price information

vii) Political and economic information

viii) General news of trade information

ix) Abstracts of relevant articles of related journal or of products or of books

x) Management and legal information

xi) Advertisement of products and jobs

The technical articles in journals usually related to review to technical topics, technical evaluations of machines, buyer guides, specifications, original and scientific definitions. Non scientific articles cover management topics, labour relations in the individual firms, legal and governmental information and historical information (materials). Abstracts of papers
presented to indicate the basic content of an article. It is a kind of current awareness information to give what is new in many journals. Besides this the R&D can keep consultants who can identify information from variety of sources and supply to industries.

3.4 Competitors' Profile.

This refers primarily to competitors' information. Gathering information on competitors is a kind of intelligence information. Many times information obtained cannot be directly correlated to existing information. Most of the information derived covers information on other companies details such as companies characteristics. Whether the company has substitute to the product it has, what are its capacity to meet market preference, what are its products plan, what are the edges it has got over the company. This is planning to establish data banks of product development can be developed to meet company information needs.

4. PRODUCT IMPROVEMENT:

A) This needs a kind of forecasting information. Information given relating to potential consumers preferred at a late stage i.e., analysis of the trends of future consumption in relation to materials, products and services. Such information can be obtained by commissioning new projects or providing support to consultants. The second aspect of function is the availability
of variety of raw materials, manpower skills, new technologies and other resource development activities.

Forecasting also requires the abilities of the company to meet the future requirements, financially as well as competitively in relation to many of companies that are in the fray for the five year plans.

B) This is a market analysis of data which is to be organised, derived, inferred from various co-relates we get from the environmental scanning and other aspects. This is a confidential and internal information which will be useful for the companies production.

C) Based on the information gathered and also the informally available information on various specifications of the company, such as the companies financial capacities, manpower profession and non professional skills, ability to meet the new challenges and its capacity to transfer and co-relate the same with different companies. Such an analysis can draw an essential plan of priorities and develop optimal requirements.

D) This requires the various ways in which information is collected, stored, distributed, retrieved and disseminated in the R&D groups. In particular it discusses the way in which the design of R&D system should go through.

The following diagram presents relative success of different strategies for production innovation. (Fig. 12).
FIG. 12. RELATIVE SUCCESS OF DIFFERENT PRODUCT INNOVATION STRATEGIES

1. Technology Driven
   (includes "Technology-driven" and
   "High-budget, diverse")
   Moderate to poor performance
   Low success, low profitability,
   ranking near the bottom

2. Market-Driven
   (Includes "Low-budget, conservative" and
   "Defensive, focused, technologically deficient")
   Low budget was satisfactory in
   performance, but with little effect on
   sales and profits. Defensive was
   poor performance, and deficient on
   most measures

3. Dual-Drive
   (includes "Balanced strategy")
   Fared and best, First on nearly
   every performance measure

HOW SUCCESS WAS MEASURED

1. Meeting new product program performance objectives
2. Generating sales and profits
3. Success of the program versus competitors
4. Overall success of the program
5. MATURITY STAGE.

A) Based on the data obtained and general information that gives the status of the current and future development of various activities within nation and within the organisation. They should be able to project strategic goals, find capability between these strategic goals and the R&D system. Should be able to give a priority area programming by the access to its users.

B) The companies R&D intelligent services also should look into information flows and production details happening in a group of companies in which the company has potential interest. In this regard it should be able to collect information from various intelligence agencies, evaluate those information and advise the company management on the feasibility of taking various companies and their products information for implementing future expansion.

C) In order to develop new products a company has to look into several criteria.

(i) First criteria on performance; is the procedures specific to satisfy its performance specifications. If so the specifications itself are satisfactory. i.e., that the products do, what is the purpose for which it was designed for.

(ii) Construction is in most areas of final assemblies, product will continue to perform reliable in view of materials specified plan, what for user to be expected to be a reasonable life span.
iii) Safety: Does the product performance has been challenged or is it constructed or useful in a manner to meet consumer needs and information for its safety this purpose can be handled by the companies. Does the product needs company standards to meet new safety specifications.

iv) Ergonomics: Is the product easy to use or maintain or instructions if any in use of describing the maintenance of the products. For this purpose, latest information on Ergonomics, Robotics and other fields is needed.

v) Aesthetics: aesthetics is the form, pattern, structure and colour of the product. Sufficient supply to engender a desire to process on use of it. It needs information on how to attract consumer attention and how to project the personality of the product for market purposes.

vi) Value for money: Parts of the products is resemble in relation to the characters can be defined to the above questions and in relation to the similar products of the market. It require information regarding component specifications.

Thus, new products should be based on the opportunities in market and knowhows and the design of products in the market. These criteria are further usable for product evaluation. We may have the following considerations:

a) What are the total sales in the market for which the product is intended?

b) Are the sales are increasing or decreasing?
c) If so is there any facility for focussing special market sectors?

d) Is it possible to make product changes which can lead to increase sales or reduce cost?

e) Has the product survey consequences for marketing and sales of other products?

f) Does the marketing approach not have any inhibiting or encouraging effect?

g) Does the elimination of a product cause dissatisfaction among dealers and customers?

h) Is the product necessary to maintain employment?

g) Do obvious alternative product exists?

i) If the evaluation of the product says that it should be abandoned, then a plan is to be setup i.e., how to be done.

j) Information has to be gathered for possible selling or take over the product of other companies.

D This can be done by developing a kind of matrix. The matrix should discuss:

i) On determination of product market contribution.

ii) On determination of possible of options available to introduce products.

iii) Design and analysis of matrix.

iv) The product mix, strategic option matrix indicates all kinds of strategy continuations. It can be simplyfied
by continued option, for e.g., acquisitions, joint venture etc. and enlarged by production market combinations.

At one extreme in the matrix, are improvements in connection with the production of existing products and are existing markets. Such an improvement strategy can be implemented by a new manufacturing process. A new approach to distribution, change in advertising methods etc. has also to be planned.

At the other extreme of the matrix is the strategy based on pioneering technological effort through the internal or external development of new products to be sold in the specified market.

A PMSO MATRIX IS AS FOLLOWS.

**STRATEGY FUNCTION**

<table>
<thead>
<tr>
<th>Product market combination</th>
<th>Existing products</th>
<th>New products</th>
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<tbody>
<tr>
<td></td>
<td>Existing</td>
<td>New</td>
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<tr>
<td>Strategic options</td>
<td>Market</td>
<td>New</td>
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<td>1) Improvement</td>
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<td>2) Purchase of licenses</td>
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<td>3) Mergers</td>
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<td>4) Acquisitions</td>
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<td>5) Joint ventures</td>
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<td>6) Internal R&amp;D</td>
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<td>7) External R&amp;D</td>
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<td>8) Sub contracting</td>
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<td>9) Distribution</td>
<td>through others.</td>
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<tr>
<td>10) Distribution for others.</td>
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<tr>
<td>11) Manufacturing for others.</td>
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<tr>
<td>12) Selling of licences.</td>
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<td>13) Divestment</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>14) Consolidation</td>
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</table>
E) In order to implement development programmes in production, the design cell calls upon enough and variety of information and data. Engineering companies engaged in the design and manufacture of product generally acquire relevant data slowly with package of time, renewing or adding to them as need arises. Such data which may be internally generated or obtained or from the external sources of the company and in company or from personal files.[9]

Surveys have shown that most designing data used in industries are between 10 to 15 years old and it is also reviewed and these are obtained through companies expanding their resources on data searches and acquisitions. While certain basic data remains unchanged; other data are changing rapidly. The highly competitive product market coupled with such consideration as product liability, demands a much more dynamic approach to data acquisitions and systematic review.[10]

The three basic difficulties in searching implementing datas are:[11]

i) Ascertaining what data are available.

ii) Identifying locations of required data.

iii) Obtaining access to specific documents in order to ascertain their usefulness.

In the final analysis a designer's works results in a product to meet the market need. So that the product should examine performance satisfaction, to be aesthetically pleasing and safe to use. To meet variety of other requirements, some
more information is needed under severely limited resources and stress. The following considerations are to be made:

i) information which is readily address the designers' needs, particularly up-to-date information.

ii) Accuracy in information.

iii) Reliability of information

iv) Succinctly presented information

v) Information clearly set for use.

The range of data required by designer or by engineers is immense. The requirement analysis in collaborative efforts between practicing designers, information scientists and consumers is to be formulated. Then relevant existing data and source document are to be traced. We may have to design and to develop new data sheets to meet the designers' needs.

The tasks of deciding exactly what should be included in selection index is a matter of continuing debate. What is appropriate for exhibition caption may not be suitable for buyers guide or to a report in a magazine. Consequently different versions of the product of description are produced by different people for different purposes.

It remains to be seen however, the concept judgement as an important element of product evaluation. It has to be accepted by government in its product approval programme and by the same token, whether designer selection will be validated as an official approval scheme. In the mean time much will depend on creating wider understanding what is the R&D stands for? One
possible strategy for infusing information into R&D process is to introduce a massive promotional effort to achieve recognition of the already established label.

An alternative approach would be built on the recognition value on the existing label with some modest advertising and other promotional means to change the perception for what information outputs of R&D stands for among both industries and public.[11]

6. CONCLUSION.

Product development is an essential process that takes in an R&D cell of organisation. A product planning life cycle goes by a variety of stages namely new technology package, production package, market package, financial management and consumer adoption process etc.

The information flow in each of these steps is vital and valuable. Information resource planning should take care of these problems. A possible format for product development is presented in the following diagram. (Chart-7)
Chart-7 A POSSIBLE FORMAT FOR PRODUCT DEVELOPMENT

<table>
<thead>
<tr>
<th>R&amp;D Prototype (Or Trial £1)</th>
<th>Plant Equipment (Or Trial £2)</th>
<th>&quot;Equivalent&quot; Substitutes</th>
<th>&quot;Improvements&quot; Differences</th>
</tr>
</thead>
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</table>

Results

- Descriptions of the final products.

Equipment

- This can be a very long list, and include such things as: the design, length and shape of transmission lines, sizes of motors.
- Age, maintenance and condition of equipment, etc.
- This category may need to be broken down into many subcategories for ease of discussion.

Environment (Where)

- Conditions of temperature, humidity, and their variabilities.
- Vulnerability to contamination, presence or absence of vents, drafts, vibration, etc.,

Process

- Raw material inputs (suppliers, quality, quantity, consistency).
- (Can include that preceded the process concerned, as well as equipment preparation.)
- Sequence and timing of different stages. Measurement points and their indications.

Scale (Extent)

- Amounts of inputs, throughputs, outputs.
- First quality production, waste.

Human Resources

- Experience, training, headcount allocation.
- Type of supervision and monitoring. Shift, time of day or week.
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